APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/850,040	05/07/2001	George E. Carter	01 P8145 US	9560

7590   04/25/2003

Siemens Corporation
Attn: Elsa Keller, Lega Administrator
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EXAMINER
SINGH, RAMNANDAN P

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No. 09/850,040	Applicant(s) CARTER ET AL.
	Examiner Dr. Ramnandan Singh	Art Unit 2644

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 May 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claims 27-30 are rejected under 35 U.S.C. 112, second paragraph, as being

mis-descriptive.

Claim 27 recites a limitation "**computer code that receives digital signals**

including telephony sounds" on page 32, line 23.

The <u>computer code</u> does not receive digital signals. It is the processor that

receives digital signals, not the code.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1-2, 6-11, 22-27, 29-30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Berestesky [US 6,321,194 B1].

Regarding claims 1-2, 11, 22-23, 25-26, Berestesky teaches a computer

implemented method for detecting a voice in an audio signal in computer telephony

systems [col. 6, lines 37-43], comprising: receiving digital signals including telephony

sounds at step 32 in Fig. 3 [col. 3, lines 9-11]; performing time-to-frequency domain

conversion at step 36 in Fig. 3; detecting speech sounds amid tones based on

parameters, such as frequency domain maxima, are extracted from the signal (step

38) and are compared to pre-determined thresholds (step 40) [col. 2, lines 1-28].

Further, Berestesky teaches an implementation apparatus using a computer program

product that makes these software filters [col. 6, lines 44-51].

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art at the time the invention was made to apply some well-known low-pass,

high-pass, band-pass or notch filters in the art depending on the type of the noise

detected.   This filtering will reduce the noise and provide an enhancement of sound

quality.

Regarding claims 6-7, Berestesky teaches detecting voice signals in all

frequencies including well-known power line fundamental frequencies, namely, 50

Hertz, 60 Hertz, and their harmonics 100 Hertz, 120 Hertz, 150 Hertz, 180 Hertz.

Regarding claims 8-10, 24, these claims refer to a frame of data over a time

interval. Berestesky teaches a method for detecting voice in audio signals using several frequency-domain averaged features that may occur every 10 ms or shorter [col. 3, line 61 to col. 4, line 46; col. 2, lines 38-51].

Regarding claims 27, 29-30, Berestesky teaches an implementation apparatus embodying the above methods, the apparatus includes input and output devices, a computer processor, and a computer program product tangibly embodied in a machine-readable storage device for execution by a programmable processor [col. 6, lines 44-51].

5.   Claims 1-4, 6-11, 12-13, 15-16, 18-19, 21-27, 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al [4,820,059].

Regarding claims 1-2, 11, 22-23, 25-26, Miller at al teaches a method for detecting speech sounds by using time-windowing to generate digital samples, and then transforming these samples with a DFT to produce a frequency spectrum as shown in Fig. 5 . Further, Fig. 4 illustrates a computer program flow chart to generate a spectrum to detect speech sounds [col. 7, line 17 to col. 8, line 21; col. 8, lines 22-56]. Also, Miller et al applies a predetermined threshold to detect sounds in the spectrum [Figs. 13A, 13B; col. 13, lines 15-24].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply some well-known low-pass, high-pass, band-pass or notch filters in the art depending on the type of the noise detected. This filtering will reduce the noise and provide an enhancement of sound quality.

Regarding claims 27, 29-30, Miller teaches a computer program to implement the speech sound detection method [col. 6, line 66 to col. 7, line 43].

Regarding claims 3-4, 12-13, 16, Miller et al teaches speech processing using two frequency band B1 and B2; and three frequency bands B1, B2, B3 having overlaps or no overlaps as a way of discriminating P1, P2, P3 peaks [Figs. 4, 5; col. T, line 17 to col. 8, line 21; col. 13, lines 38-53; Figs. 8-9]. Further. It may be noted that the amplitude of the spectrum of the noise is uniform over all frequencies. Therefore, it is obvious that, in the absence of speech signals, the amplitudes of sounds in two or more frequency bands are substantially the same. Thus, Miller teaches employing first band, second band, and third band (or low, middle, and high bands) for detecting whether noise is present in voice signals . This multi-band speech sound detection method compensates for a susceptibility of noise and provides an improved speech recognition system [Miller et al; col. 1, lines 20-23].

Regarding claims 6-7,19-20, Miller et al teaches detecting voice signals in all frequencies including well-known power line fundamental frequencies, namely, 50 Hertz, 60 Hertz, and their harmonics 100 Hertz, 120 Hertz, 150 Hertz, 180 Hertz, Since this is a case of frequency interference, this needs to be rejected. At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply a notch filter to remove these power frequencies.

Regarding claims 8-9, 15, 18, 21, 24, these claims refer to a frame of data over a time interval. Miller et al teaches a method for detecting voice in audio signals using several frequency-domain averaged features that may occur every 10 ms or shorter [col. 7, line 64 to col. 8, line 18].

Regarding claims 10, 26, Miller et al teaches setting to zero all spectral values which are less than a predetermined threshold decibel level [Miller et al; col. 13, lines 15-23].

6.   Claims 1-4, 6-11, 12-13, 15-16, 18-19, 21-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhao et al [US 6,480,823 B1].

Regarding claims 1-2, 11, 22-23, 25-26, Zhao et al teaches a method for detecting speech sounds for noisy conditions by using a Hamming-window to generate digital samples, and then transforming these samples with a FFT to produce a

frequency spectrum [Fig. 1; col. 2, line 52 to col. 3, line 12]. In addition Zhao et al applies thresholds to detect speech sounds [Figs. 6-12; col. 2, lines 33-51].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply some well-known low-pass, high-pass, band-pass or notch filters in the art depending on the type of the noise detected. This filtering will reduce the noise and provide an enhancement of sound quality.

Regarding claims 3-4, 12-13, 16, Zhao et al teaches a method for detecting speech sound using multiple frequency bands [col. 3, lines 34-47]. Further. It may be noted that the amplitude of the spectrum of the noise is uniform over all frequencies. Therefore, it is obvious that, in the absence of speech signals, the amplitudes of sounds in two or more frequency bands are substantially the same. Thus, Zhao et al teaches employing multi-bands in the frequency domain for detecting whether noise is present in voice signals [Figs. 10-11; col. 10, lines 13-57; col. 8, line 52 to col. 9, line 36; col. 7, lines 52-60].

Regarding claims 6-7,19-20, Zhao et al teaches detecting voice signals in all frequencies including well-known power line fundamental frequencies, namely, 50 Hertz, 60 Hertz, and their harmonics 100 Hertz, 120 Hertz, 150 Hertz, 180 Hertz, Since this is a case of frequency interference, this needs to be rejected. At the time of the

invention, it would have been obvious to a person of ordinary skill in the art at the time

the invention was made to apply a notch filter to remove these power frequencies.

Regarding claims 8-9, 15, 18, 21, 24, these claims refer to a frame of data

over a time interval. Zhao et al teaches a method for detecting voice in audio signals

using several frequency-domain averaged features that may occur every 10 ms or

shorter [Figs. 7-12].

Regarding claims 10, 26, Zhao et al teaches detecting speech sounds at all

frequencies [Figs. 11, 12; col. 8, lines 24-41].

7.   Claims 5, 14, 17 and 28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over either Berestesky or Miller et al as applied to claims 1, 12, 16, and 27

above, and further in view of either Harris et al [US 4,255,620] or Fielder [5,752,225].

Regarding claims 5, 14, 17 and 28, both Berestesky and Miller et al teach

detecting speech sounds in audio signals. But neither Berestesky nor Miller et al teach

expressly these three sub-bands as claimed.

Harris et al teaches a basis for selecting these three sub-bands for detecting

speech sounds. It has long been known that the prime intelligibility of human speech

lies in the band from about 1000 to about 3000 Hz, and that human speech is naturally

temporally divided   into higher frequency components (the consonants) occurring in the

range from about 1500 to about 3000 Hz and lower frequency components (vowels)

occurring in the rang from about o to about 1500 Hz [col. 25-52]. The cross-over region

at approximately 500 Hz is a potential distortion region [col. 10, lines 15-47]. Fig. 4F

illustrates the time averaged spectrum of signals [Figs. 4E, 4F; col. 10, line 60 to col. 11,

line 35].

Fielder teaches an empirical technique for allocating a whole band into sub-

bands. Fig. 7 illustrates critical band spectra of the output noise and distortion.

Allocation C is then the same as allocation B for frequencies in the upper part of the

audio band above 1500 Hz. The dotted line shows the auditory masking curve for a 500

Hz tone [col. 3, line 50 to col. 4, line 43].

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art at the time the invention was made to select the three sub-bands of Harris

et al and Fielder, wherein the low band includes sounds less than 500 Hz, the middle

band includes sounds from 500 to 1500 Hz, and the high band includes sound greater

than 1500 Hz. The motivation for this to use the actual bandwidth occupied by human

speech sound, and speed up detecting audio signals [Harris et al; col. 1, lines 11-16].
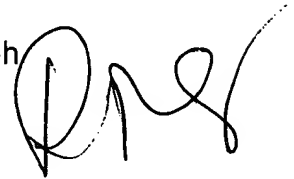
Conclusion

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9314 for regular communications and (703)872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-0377.

Dr. Ramnandan Singh
Examiner
Art Unit 2644

April 14, 2003

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